

What is claimed is:

1. A method of digital image processing using face detection for achieving a desired spatial parameter, comprising:
 - (a) identifying a group of pixels that correspond to a face within a digital image;
 - (b) identifying one or more sub-groups of pixels that correspond to one or more facial features of the face;
 - (c) determining initial values of one or more parameters of pixels of the one or more sub-groups of pixels;
 - (d) determining an initial spatial parameter of the face within the digital image based on the initial values; and
 - (e) determining adjusted values of pixels within the digital image for adjusting the image based on a comparison of the initial and desired spatial parameters.
2. The method of claim 1, the initial spatial parameter comprising orientation.
3. The method of claim 1, further comprising automatically adjusting the values of the pixels within the digital image to adjust the initial spatial parameter approximately to the desired spatial parameter.
4. The method of claim 1, further comprising automatically providing an option for adjusting the values of the pixels within the digital image to adjust the initial spatial parameter to the desired spatial parameter.
5. A method of digital image processing using face detection to achieve a desired orientation, comprising:
 - (a) identifying one or more groups of pixels that correspond to a face within a digital image;
 - (b) identifying one or more sub-groups of pixels that correspond to one or more facial features of the face;

(c) determining initial values of one or more parameters of pixels of the one or more sub-groups of pixels;

(d) determining an initial orientation of the face within the digital image based on the initial values; and

(e) determining adjusted values of pixels within the digital image for adjusting the orientation to the desired orientation.

6. The method of claim 5, further comprising determining which of the sub-group of pixels belong to which said group of face pixels.

7. The method of claim 5, said determining initial values of one or more parameters of pixels being calculated based on the spatial orientation of said one or more sub-groups that correspond to one or more facial features.

8. The method of claim 7, the spatial orientation of said one or more sub-groups that correspond to one or more facial features being calculated based on an axis of an ellipse fit to said sub-group.

9. The method of claim 5, said adjusted values of pixels within the digital image being rounded to a closest multiple of 90 degrees.

10. The method of claim 5, further comprising adjusting the initial values to adjusted values for re-orienting the image to an adjusted orientation.

11. The method of claim 5, the one or more facial features including an eye.

12. The method of claim 5, the one or more facial features including two eyes.

13. The method of claim 5, the one or more facial features including two eyes and a mouth.

14. The method of claim 5, the one or more facial features including an eye, a mouth, lips, hairline, ears, nostrils, nose bridge, eyebrows, chin, neck or a nose, or combinations thereof.
15. The method of claim 14, the one or more facial features including an eye, a mouth, hairline, two eyes, a nose, an ear, two ears, a neck, shoulders, one or more other facial features, one or more personal features other than a facial feature, a feature associated with a person other than a personal feature, another feature that is indicative of orientation, or combinations thereof.
16. The method of claim 15, the feature that is indicative of orientation including an article of clothing, furniture, transportation, outdoor environment, horizon, tree, water, indoor environment, doorway, hallway, ceiling, floor, wall, or combinations thereof.
17. The method of claim 5, the one or more facial features including at least two features, the initial values including positions of the at least two features, the method further comprising determining relative positions of the at least two features based on the initial values, and the initial orientation being determined based on the relative positions of the at least two features.
18. The method of claim 5, the one or more facial features including at least three features, the initial values including positions of the at least three features, the method further comprising determining a shape based on the initial values, and the initial orientation being determined based on one or more properties of the shape.
19. The method of claim 18, the shape comprising a polygon having points corresponding to the at least three features as vertices.
20. The method of claim 19, the shape comprising a triangle.
21. The method of claim 5, further comprising automatically adjusting the initial orientation to an adjusted orientation.

22. The method of claim 5, further comprising automatically providing an option for adjusting the initial orientation to a suggested orientation.
23. A method of digital image processing using face detection for achieving a desired chromatic parameter, comprising the steps of:
 - (a) identifying a group of pixels that correspond to a face within a digital image;
 - (b) identifying one or more sub-groups of pixels that correspond to one or more facial features of the face;
 - (c) determining initial values of one or more chromatic parameters of pixels of the one or more sub-groups of pixels;
 - (d) determining at least one initial chromatic parameter based on the initial values; and
 - (e) determining adjusted values of the one or more chromatic parameters of the pixels of the one or more sub-groups of pixels based on a comparison of the initial chromatic parameter with the desired chromatic parameter.
24. The method of claim 23, the one or more chromatic parameters including color.
25. The method of claim 23, the one or more chromatic parameters including tone.
26. The method of claim 23, further comprising adjusting values of the pixels from the initial values to the adjusted values.
27. The method of claim 23, further comprising automatically adjusting values of the pixels from the initial values to the adjusted values.
28. The method of claim 23, further comprising automatically providing an option for adjusting values of the pixels from the initial values to the adjusted values.
29. One or more processor readable storage devices having processor readable code embodied thereon, said processor readable code for programming one or more processors to perform a

method of digital image processing using face detection for achieving a desired spatial parameter, comprising:

- (a) identifying a group of pixels that correspond to a face within a digital image;
- (b) identifying one or more sub-groups of pixels that correspond to one or more facial features of the face;
- (c) determining initial values of one or more parameters of pixels of the one or more sub-groups of pixels;
- (d) determining an initial spatial parameter of the face within the digital image based on the initial values; and
- (e) determining adjusted values of pixels within the digital image for adjusting the image based on a comparison of the initial and desired spatial parameters.

30. The one or more storage devices of claim 29, the initial spatial parameter comprising orientation

31. The one or more storage devices of claim 29, the method further comprising automatically adjusting the values of the pixels within the digital image to adjust the initial spatial parameter approximately to the desired spatial parameter.

32. The one or more storage devices of claim 29, the method further comprising automatically providing an option for adjusting the values of the pixels within the digital image to adjust the initial spatial parameter to the desired spatial parameter.

33. One or more processor readable storage devices having processor readable code embodied thereon, said processor readable code for programming one or more processors to perform a method of digital image processing using face detection to achieve a desired orientation, comprising:

- (a) identifying one or more groups of pixels that correspond to a face within a digital image;
- (b) identifying one or more sub-groups of pixels that correspond to one or more facial features of the face;

- (c) determining initial values of one or more parameters of pixels of the one or more sub-groups of pixels;
- (d) determining an initial orientation of the face within the digital image based on the initial values; and
- (e) determining adjusted values of pixels within the digital image for adjusting the orientation to the desired orientation.

34. The one or more storage devices of claim 33, the method further comprising determining which of the sub-group of pixels belong to which said group of face pixels.

35. The one or more storage devices of claim 33, said determining initial values of one or more parameters of pixels being calculated based on the spatial orientation of said one or more sub-groups that correspond to one or more facial features.

36. The one or more storage devices of claim 35, the spatial orientation of said one or more sub-groups that correspond to one or more facial features being calculated based on an axis of an ellipse fit to said sub-group.

37. The one or more storage devices of claim 36, said adjusted values of pixels within the digital image being rounded to a closest multiple of 90 degrees.

38. The one or more storage devices of claim 33, the method further comprising adjusting the initial values to adjusted values for re-orienting the image to an adjusted orientation.

39. The one or more storage devices of claim 33, the one or more facial features including an eye.

40. The one or more storage devices of claim 33, the one or more facial features including two eyes.

41. The one or more storage devices of claim 33, the one or more facial features including two eyes and a mouth.
42. The one or more storage devices of claim 33, the one or more facial features including an eye, a mouth, hairline, ears, neck, chin, nostrils, nose bridge, eyebrows or a nose, or combinations thereof.
43. The one or more storage devices of claim 33, the one or more facial features including an eye, a mouth, hairline, two eyes, a nose, an ear, two ears, a neck, shoulders, one or more other facial features, one or more personal features other than a facial feature, a feature associated with a person other than a personal feature, another feature that is indicative of orientation, or combinations thereof.
44. The one or more storage devices of claim 43, the feature that is indicative of orientation including an article of clothing, furniture, transportation, outdoor environment, horizon, tree, water, indoor environment, doorway, hallway, ceiling, floor, wall, or combinations thereof.
45. The one or more storage devices of claim 33, the one or more facial features including at least two features, the initial values including positions of the at least two features, the method further comprising determining relative positions of the at least two features based on the initial values, and the initial orientation being determined based on the relative positions of the at least two features.
46. The one or more storage devices of claim 33, the one or more facial features including at least three features, the initial values including positions of the at least three features, the method further comprising determining a shape based on the initial values, and the initial orientation being determined based on one or more properties of the shape.
47. The one or more storage devices of claim 46, the shape comprising a polygon having points corresponding to the at least three features as vertices.

48. The one or more storage devices of claim 47, the shape comprising a triangle.
49. The one or more storage devices of claim 33, the method further comprising automatically adjusting the initial orientation to an adjusted orientation.
50. The one or more storage devices of claim 33, the method further comprising automatically providing an option for adjusting the initial orientation to a suggested orientation.
51. The one or more storage devices of claim 33, wherein said processor is located within a digital printing device.
52. The one or more storage devices of claim 33, wherein said processor is located within a digital image acquisition device.
53. The one or more storage devices of claim 33, wherein said processor is located within a digital display device.
54. The one or more storage devices of claim 33, further comprising the step of displaying multiple images at once after said adjusting of orientation.
55. One or more processor readable storage devices having processor readable code embodied thereon, said processor readable code for programming one or more processors to perform a method of digital image processing using face detection for achieving a desired chromatic parameter, comprising the steps of:
 - (a) identifying a group of pixels that correspond to a face within a digital image;
 - (b) identifying one or more sub-groups of pixels that correspond to one or more facial features of the face;
 - (c) determining initial values of one or more chromatic parameters of pixels of the one or more sub-groups of pixels;
 - (d) determining at least one initial chromatic parameter based on the initial values; and

(e) determining adjusted values of the one or more chromatic parameters of the pixels of the one or more sub-groups of pixels based on a comparison of the initial chromatic parameter with the desired chromatic parameter.

56. The one or more storage devices of claim 55, the one or more chromatic parameters including color.

57. The one or more storage devices of claim 55, the one or more chromatic parameters including tone.

58. The one or more storage devices of claim 55, the method further comprising adjusting values of the pixels from the initial values to the adjusted values.

59. The one or more storage devices of claim 55, the method further comprising automatically adjusting values of the pixels from the initial values to the adjusted values.

60. The one or more storage devices of claim 55, the method further comprising automatically providing an option for adjusting values of the pixels from the initial values to the adjusted values.